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(54) Automatic image cropping

(57) The present invention describes a method for automatic cropping of images containing regions where intensity levels are uniform and other regions where intensity levels vary considerably. An image to be automatically cropped is scaled down to a grid and divided into non-overlapping blocks. The mean and variance of an intensity level are calculated for each block. Based on the distribution of variances in the blocks, a threshold is selected for the variance. All blocks with a variance higher than this threshold variance are selected as regions of interest. The regions of interest are then cropped to a bounding rectangle.

FIG.3A

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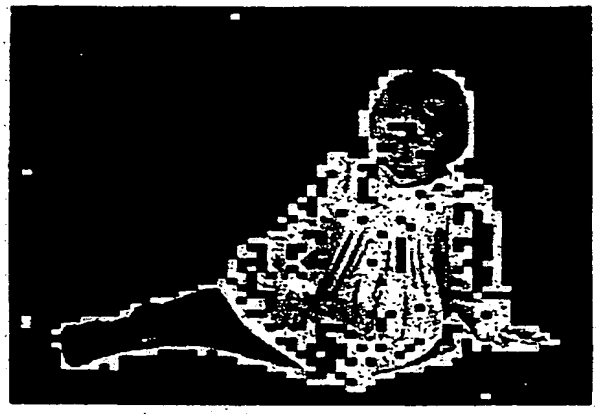

FIG.3B

FIG.3C

FIG.3D

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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 5609

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 576 961 A (EASTMAN KODAK CO) 5 January 1994 (1994-01-05) * page 2, line 21 - page 3, line 39; figure 1C *	1-10	G06T7/00 G06T5/00
A	US 5 138 671 A (YOKOYAMA HARUHIKO) 11 August 1992 (1992-08-11) * column 1, line 52 - column 2, line 51; figure 9 *	1-10	
A	US 5 046 118 A (AJEWOLE ISAAC A ET AL) 3 September 1991 (1991-09-03) * column 3, line 54 - column 4, line 10 * * column 5, line 54 - column 6, line 33 *	1-10	
A	US 5 329 461 A (ALLEN FRITZ ET AL) 12 July 1994 (1994-07-12) * column 12, line 40 - column 13, line 51; figure 7 *	1-10	
A	US 5 887 082 A (MITSUNAGA TOMOO ET AL) 23 March 1999 (1999-03-23) & JP 08 163434 A (...) 21 June 1996 (1996-06-21) * abstract *	1-10	TECHNICAL FIELDS SEARCHED (Int.Cl.6) G06T H04N
A	KOHLER R: "A SEGMENTATION SYSTEM BASED ON THRESHOLDING" COMPUTER GRAPHICS AND IMAGE PROCESSING, ACADEMIC PRESS. NEW YORK, US, vol. 15, no. 4, 1 April 1981 (1981-04-01), pages 319-338, XP000611793 * the whole document *	1-10	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	9 April 2002	Herter, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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09-04-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0576961 A	05-01-1994	US 5268967 A	07-12-1993
		DE 69331251 D1	17-01-2002
		EP 0576961 A2	05-01-1994
		JP 6348818 A	22-12-1994
US 5138671 A	11-08-1992	JP 2073961 C	25-07-1996
		JP 3160573 A	10-07-1991
		JP 7104921 B	13-11-1995
		KR 9306802 B1	23-07-1993
US 5046118 A	03-09-1991	DE 69111932 D1	14-09-1995
		DE 69111932 T2	11-04-1996
		EP 0466907 A1	22-01-1992
		JP 4505228 T	10-09-1992
		WO 9112540 A1	22-08-1991
US 5329461 A	12-07-1994	EP 0651879 A1	10-05-1995
		JP 7509314 T	12-10-1995
		WO 9402831 A1	03-02-1994
		US 5488567 A	30-01-1996
US 5887082 A	23-03-1999	JP 8163434 A	21-06-1996
		US 6252985 B1	26-06-2001

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82